NC DEPARTMENT OF
**HEALTH AND
HUMAN SERVICES**

NASCIO State IT Recognition Awards

Business Process Innovations
Award Nomination

State of North Carolina
Department of Health and Human Services
Hospital Automation Project: Critical Resource Tracker

**When Minutes Mattered: Automated COVID-19 Reporting
System Saved Hospitals' Time & Reduced Administrative
Burden**

Project Initiation: February 2020
Project Implementation: April 2020

Submitted By: Charles Carter
Assistant Secretary for Technology Services
State of North Carolina
Department of Health and Human Services
Mailing Address: 2001 Mail Service Center Raleigh, NC 27699-2000
Physical Address: 101 Blair Drive Raleigh NC 27603
Phone: 919-855-3000
Email: Charles.Carter@dhhs.nc.gov

Executive Summary:

The emergence of the COVID-19 virus in 2020 crippled the world. Businesses were forced to close, and people were required to isolate. For the first time in history, government officials and medical personnel were struggling to determine not only how to fight the virus, but also how to get ahead of it. COVID-19 was, without question, debilitating for the country, from the economy to individuals' health and livelihood. Hospital systems across the country were hit the hardest, unprepared to handle both the exodus and then influx of patients, the shortage of personal protective equipment, and the diminished capacity of essential equipment required to care for COVID patients. With death rates climbing at an astronomical pace, innovative real-time reporting became critical for our government to not only track the influx of patients with the virus, but to also direct lifesaving resources to the hardest hit hospitals. At the end of March 2020, the U.S. Department of Health and Human Services built HHS Protect, with the goal to share, parse, and access necessary COVID-19 related data. While it had good intent, the reporting requirements were challenging to manage manually, taking time away from patient care, while nurses spent countless hours compiling and submitting the requested information to the State and Federal Governments.

The North Carolina Department of Health and Human Services implemented a Critical Resource Tracker (CRT) to help hospitals comply with these federal and state reporting requirements. The CRT developed by OpenBeds, is a solution that provides transparency and an immediate inventory of available critical beds, vital equipment, and trained clinicians across healthcare facilities. It helps hospitals and states identify surpluses, shortages, or gaps to better manage needs in a pandemic or crisis. OpenBeds CRT automates accurate, on-time data and delivers comprehensive data analytics and trends at the regional, state, and hospital level.

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MAILING ADDRESS: 2001 Mail Service Center, Raleigh, NC 27699-2000
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Idea:

The North Carolina Department of Health and Human Services (NCDHHS) manages the delivery of health-and human-related services for all North Carolinians, especially our most vulnerable citizens – children, elderly, disabled and low-income families. The Department works closely with healthcare professionals, community leaders and advocacy groups; local, state, and federal entities; and many other stakeholders to make this happen. The Department is divided into 30 divisions and offices. NCDHHS divisions and offices fall under four broad service areas – health, human services, administrative, and support functions. NCDHHS also oversees 14 facilities such as developmental centers, neuro-medical treatment centers, psychiatric hospitals, alcohol and drug abuse treatment centers, and residential programs for children.

COVID-19's strain on the state's healthcare resources—both services and supplies—created several issues voiced by state representatives, hospital administrators, and clinicians.

At the end of March 2020, the U.S. Department of Health and Human Services built HHS Protect to share, parse, and access necessary COVID-19 related data. Manually managing the reporting requirements for HHS Protect took time away from patient care. Nurses spent countless hours compiling and submitting the requested information to the state and federal governments.

The following issues combined not only hindered patient access to care across North Carolina, but also to drained hospitals' human resources and created unprecedented financial stress:

- Even with guidance from federal government regarding data reporting, administrators and clinicians lacked a specific definition of reporting, resulting in inaccurate or subjective data.
- Antiquated data collection and reporting systems could not scale quickly enough to ensure compliance with constantly changing federal reporting requirements
- State administrators lacked a complete, real-time view of available ICU beds, PPE, and other resources across the state's hospitals
- Manual hours associated with daily tracking and reporting of data were not sustainable long term, during this pandemic or any future crisis.

NCDHHS partnered with Bamboo Health/OpenBeds to pilot a Critical Resource Tracker (CRT); a better solution for tracking, reporting, and automating vital data related to the COVID-19 pandemic. The OpenBeds CRT, helps hospitals comply with federal and state reporting requirements and provides transparency and an immediate inventory of available critical beds,

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vital equipment, and trained clinicians across healthcare facilities. It helps hospitals and states identify surpluses, shortages, or gaps to better manage needs in a pandemic or crisis. In addition, OpenBeds CRT automates accurate, on-time data and delivers comprehensive data analytics and trends at the regional, state, and hospital level.

"A major challenge for hospitals was a mechanism to be able to trend and report out data. The existing data collection systems didn't enable them to do this well," said Dr. Nishi Rawat, chief clinical officer of Bamboo Health and co-founder of OpenBeds.

"Clinicians working at smaller hospitals, community hospitals, critical access hospitals, and rural hospitals didn't have the services and resources, like ventilators, to take care of very sick COVID patients. They needed situational awareness regarding intensive care unit (ICU) beds and other resources in their region and state. That led to the development of the OpenBeds Critical Resource Tracker."

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Implementation:

North Carolina knew what had to be done, the question was now with whom and how? We needed a trailblazer to help understand what the "art of possible" was and what systems/data resources hospitals in NC could access to automate this process. As one of the nation's leading providers of healthcare services, HCA Information Technology Group, North Carolina Division presented Mission Hospital as the first hospital to complete a proof-of-concept integration with the North Carolina Department of Health and Human Services' (DHHS) online COVID-19 collection site. The site, developed by (Bamboo Health/OpenBeds), was systematically deployed to enable all North Carolina hospitals to submit their COVID-19 patient and resource counts into one simple, easy-to-use location. OpenBeds created a standards-based web services Application Programming Interface (API) enabling health systems like Mission to publish their COVID-19 lab results easily and efficiently to the state with zero human involvement. This effectively replaced an online survey submitted daily by a Mission employee and ensured our employee, bed, and vent counts are always up to date. The benefits go far beyond automation for NC State reporting though. NC DHHS also submits this information to the federal government on the hospital's behalf, eliminating another daily, manual survey. The integration was quick, streamlined, and efficient. The entire project took less than two weeks from inception to first data transmission.

What started with Mission Health, spread to all 124 hospitals throughout the state via daily collaboration and project calls. This was a learning effort with hospitals helping hospitals solve the issue of converting from a 100% manual reporting process to more of an automated approach.

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Impact:

For North Carolina, the OpenBeds CRT solution offered real-time visibility and automated required reporting to rapidly coordinate and track available critical beds, equipment resources, and trained personnel across healthcare facilities with the solution. The CRT solution fully automated the submission of data to improve its accuracy while reducing the hospitals' administrative burden of reporting real-time data. With the CRT, North Carolina was able to obtain real-time analytics and detailed reports while eliminating ambiguous interpretations of data elements via manual entry. The solution enabled automated data submission to the state and federal government via HHS Protect; allowed submission of data through a single system; provided real-time unique views at the hospital, regional, and state level to assess needs; and gave visibility of available critical COVID-19 resources.

The OpenBeds CRT was implemented in April 2020 after 4 weeks of manual reporting. Within the first six months of implementation, 75% of the state's acute care hospitals were automating their data through the CRT. The automated process saved hospitals around 2.5 hours every day to instead dedicate to patient care activities. The other 25% of hospitals used three other methods to share their data regularly, ensuring the state was aware of near-real time resources at any moment, allowing visibility into the needs and opportunities across hospitals in North Carolina.

"As a state, it was incredibly important to us that whatever option we chose was going to be able to be used by all our hospitals. Having every hospital in the same system, being able to provide the same information with the same data elements, same definitions, was incredibly important to us," said Kimberly Clement, MPH, Program Manager for the Healthcare Preparedness Program, Division of Health Service Regulation, Office of Emergency Medical

NORTH CAROLINA BY THE NUMBERS

- **2.5 hours saved daily per hospital** from collecting and reporting COVID-19 data

- **120 acute care hospitals** using the Tracker

- **80 hospitals** automating reporting to the state and federal government

- From **12 support calls per day down to 0** on hospital reporting

- From **28 support hours per week down to 0** on manual reporting

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Services, North Carolina Department of Health, and Human Services. "The OpenBeds [CRT] system has been a phenomenal partner to us through this whole response."

The system also saved hospitals and state administrators time each day through its visibility. "It decreased the need for calls and emails to check, giving transparency and access to trending data and analytics to empower the hospitals in decision making," Clement said. "We all worked through this COVID response together." The OpenBeds' technology platform is specifically designed to track the critical treatment and equipment resources needed to fight the COVID-19 pandemic. The use of this automated platform enabled all available critical resources to be used to treat those affected and in need of care. As providers actively seek treatment for their patients, a reliable, real-time resource is critical. Physicians and nurses should not have to choose between who receives care, because there are not enough ventilators to sustain patients. Knowing where the availability is helps clinicians treat more people, saving more lives.

"The use of the OpenBeds Critical Resource Tracker will enable us to take the responsibility to monitor inventory and marshal resources to address needs across hospitals within our state. By anticipating COVID-19 outbreaks, critical resources can be sent to potential hot spots so that we can respond proactively rather than reactively to a critical need within a hospital," said Charles Carter, COO Tech & Ops NCDHHS. "Our goal is to improve response time to critical hospital needs by streamlining the resource tracking process to reduce human error and the time-consuming burden of accessing life-saving information."

The data also provided valuable statistics for researchers looking to forecast COVID-19 cases in the state. Researchers used the near real-time data on COVID-19 hospitalizations across the state – made possible by the CRT – to build a hospitalization forecast model to inform pandemic planning and resource allocation. "Better real-time access to data leads to better modeling," said Charles Carter, Assistant Secretary for Technology Services, North Carolina Department of Health and Human Services. "Thanks to over 120 hospital partners throughout North Carolina and to Bamboo Health for their expertise in getting this cutting-edge Critical Resource Tracker technology integrated into our state's COVID response."

Read more about North Carolina's work with Bamboo Health through the OpenBeds Critical Resource Tracker solution in this case study.

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